2 Point Bending Test

Objective:

Test the ultimate stress for PLA (Polylactic Acid) using the 2- point bending test.

Materials:

- Bean Design 280mm x 10mm x 5mm
- Table Clamp
- Weights (1lb increments)
- 3-D Printer
- PLA (Polylactic Acid)

Software:

- Solid Edge
- MakerWare

Procedure:

1. First you design the beam in Solid Edge (measurement L 280mm x W 10mm x H 5mm). Save file as (.STL)
2. Upload the design into MakerWare. Recheck dimensions with MakerWare.
3. Have the 3-D Printer to make the design as requested.
4. Drill a hold on one end of the rectangular.
5. Once the design is completed with the 3-D Printer. Check rectangular for any possible defects (chipping, straightness, etc.)
6. Take the rectangular design and attached it to the side of table with a clamp. Please make sure the clamp is firmly tight on the design and table. Use the end of the rectangular that does not have the hole.
7. Then with hanging weights place a weight of .5 lb. Increase the weight by .5 until beam has reach its stress point. *Record Data*

Data:

Beam Dimensions: L = 280 mm w = 10 mm h = 5 mm

Beam Color: Black

Calculations:

- P = Amount of Weight at the breaking point
- L = Distance from the hanging weight to the edge of the table
- w= Width
- h = Height
- c = .5h

By using the formula below you will be able to calculate the ultimate stress of the beam.

$$\sigma = \frac{(PLc)}{12wh^3}$$